Fundamental/Overtone Crystal Oscillator

003

The schematics show two crystal oscillator circuits constructed using the high-speed LT1394 comparator from Linear Technology (www.linear-tech.com). In each case the crystal is in the positive feedback path, while in the negative feedback path an RC network provides the necessary phase lag.

Circuit (a) is designed to use AT-cut crystal oscillating at its fundamental frequency and is suitable for operation over a frequency range from 1 MHz to 10 MHz.

Circuit (b) includes the RC network consisting of R4 and C3, which reduces the gain as the frequency rises by increasing the loading on the positive feedback path correspondingly. In this way oscillations at higher multiples of the fundamental frequency are suppressed, although the wanted third harmonic must not be unduly damped. This circuit is designed to use AT-cut crystals between 10 MHz and 25 MHz.

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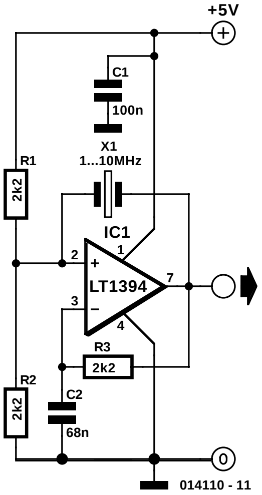
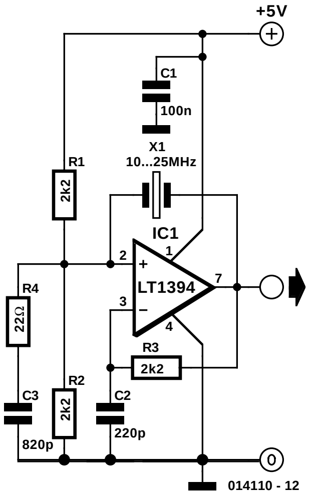


(a) Q1 = AT-cut crystal for operation at a fundamental frequency in the range 1-10 MHz



(b) Q1 = AT-cut third-overtone crystal for operation in the range 10-25 MHz